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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,541

03/08/2007

G. Michael Pope

ART2

9474

23699

7590

05/04/2009

CLAUSEN MILLER, P.C  
SUITE 1600  
10S. LASALLE STREET  
CHICAGO, IL 60603

EXAMINER

LAWRENCE JR, FRANK M

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

05/04/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,541	<b>Applicant(s)</b> POPE ET AL.	
	<b>Examiner</b> Frank M. Lawrence	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: The U.S. Patent Application numbers in paragraph 9 of the specification should be replaced with relevant publication numbers because they are incorporated by reference.

Appropriate correction is required.

2. Claims 6 and 15 objected to because of the following informalities: In each claim, a comma “,” should be inserted after “Hydroxide”. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ebeling et al. (4,661,130).

5. Ebeling et al. ‘130 teach an absorber column comprising a vessel having an interior, a lower end, an upper end, an inlet port (20) for receiving exhaust, and an outlet port (22), a liquid absorbent in the vessel for removing moisture from the exhaust, a diffuser (50) immersed in the absorbent in the lower end of the vessel for receiving the exhaust gas from the inlet and creating gas bubbles, a liquid outlet (44) in the bottom of the tank to allow drainage, surface contact balls (54) in the liquid, and a nozzle assembly (60) for spraying absorbent into the vessel while the

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bubbles rise through the absorbent (see figures, col. 2, lines 30-37, col. 3, lines 15-47, col. 4, lines 5-55).

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Bowman (2,070,578).

7. Bowman '578 teaches an absorber column comprising a vessel having an interior, a lower end, an upper end, an inlet port (17) for receiving exhaust, and an outlet port (19), a washing liquid in the vessel for removing contaminants from the exhaust, a diffuser (4) immersed in the liquid in the lower end of the vessel for receiving the exhaust gas from the inlet and creating gas bubbles, a liquid outlet (7) in the bottom of the tank to allow drainage, and a nozzle assembly (12) for spraying washing liquid into the vessel while the bubbles rise through the liquid (see figure, col. 1, line 16 to col. 2, line 6).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 8-11, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebeling et al. '130 in view of Saletan et al. (4,247,532).

10. Ebeling et al. '130 disclose all of the limitations of the claims except that the tank and liquid are configured to retain at least a portion of the small gas bubbles for approximately 4-10 seconds and that there is a cooling unit connected to the tank to allow at least a portion of the solution to flow out from the tank, through the unit, and back into the tank. Saletan et al. '532

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disclose a counter current contact tower (31) with an external heat exchanger (33) for cooling a portion of the contact liquid in the tower (see figure 2, col. 7, lines 23-64). It would have been obvious to one having ordinary skill in the art at the time of the invention to use a cooling unit in the system of Ebeling et al. '130 et al in order to provide a means for causing further condensation and removal of contaminants and for increasing the absorption capacity of the solution. It would also have been obvious to modify the contact time of the bubbles in the tank to provide an optimum level of gas/liquid contact for removal of contaminants without unnecessarily prolonging the process.

11. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebeling et al. '130 in view of Saletan et al. '532 as applied to claims 1 and 10 above, and further in view of Oropeza et al. (3,465,504).

12. Ebeling et al. '130 in view of Saletan et al. '532 disclose all of the limitations of the claims except that the tank includes an inspection port for maintenance or observation of the tank interior. Oropeza et al. '504 disclose a gas/liquid contact column (11) having an observation port (33) (figure 1, col. 2, lines 40-41). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the contact system of the primary references by including an observation port in order to provide a means to observe the operation status of the tower.

13. Claims 4, 5, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebeling et al. '130 in view of Saletan et al. '532 as applied to claims 1 and 10 above, and further in view of Teller (3,957,464).

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14. Ebeling et al. '130 in view of Saletan et al. '532 disclose all of the limitations of the claims except that the solution includes brine and caustic soda. Teller '464 discloses a process for scrubbing contaminants from a gas stream using a brine solution including sodium hydroxide (col. 6, lines 8-15). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the contact system of the prior art by using a scrubbing solution of brine and caustic soda in order to facilitate removal of acid gases.

15. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebeling et al. '130 in view of Saletan et al. '532 as applied to claims 1 and 10 above, and further in view of Klingspor et al. (2002/010511).

16. Ebeling et al. '130 in view of Saletan et al. '532 disclose all of the limitations of the claims except that the solution includes calcium hydroxide, calcium carbonate, or sodium bicarbonate. Klingspor et al. '511 disclose a gas scrubber that uses conventional scrubber compositions such as calcium carbonate (paragraph 0006). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the contact system of the prior art by using a calcium carbonate scrubber solution in order to provide desulfurization of the exhaust gas.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Lawrence whose telephone number is 571-272-1161. The examiner can normally be reached on Mon-Thurs 7:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Frank M. Lawrence/  
Primary Examiner, Art Unit 1797

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